

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

[PRICE 6D.]

IN THE VICE-WARDEN'S COURT.

PAUL and ROBERTS, Plaintiff's Solicitors, Truro.

Prague, St. in

## FORGE AND MILL AT LIVERPOOL.

**THE GARDENERS' CHRONICLE**, the Horticultural part  
 Edited by Frederick Lindley. Each volume is complete in itself. Persons  
 desirous to possess the volume should order it at once, as but very few complete  
 copies remain, although three volumes of *perennial* *Gardeners' Chronicle* have been printed.  
 The *Gardeners' Chronicle* is published every Saturday, price 6d., and may be ordered  
 of all newspapers, or sent by post, with the list of contributors during the present year.  
 The *Gardeners' Chronicle* is published at the office of the *Gardeners' Chronicle*, 10, Abchurch Lane, London.

\* The district occupied by this division, and the greater part of that, by the second or middle, are not included in the map.

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At Lydney Park the "Colford High Delf" and "Trenches" are not well defined at the angle, the outcrops being there very obscure. From this point they increase in dip, with the rising ground, to Broom's Barn, and afterwards decrease again, but at Gorse-hill and Colford descend, they become horizontal, and crop out in the continued, more from



the declivity in the ground than from their ascending position in that direction. This observation will apply to their outcrop on the north also, from a little south of Symonds-gate to Joyford and Carter's-piece Meend. At this place the line of division, ranging from Big Blade to Carter's-piece Meend, between the inclined or eastern and the horizontal or western part of the bed, emerges to the surface, and the coal crops out in opposite directions, for some distance, from the Whitberry Blade to Carter's-piece Meend; but, beyond the latter point, the two beds crop conformably with those above them, into the valley of Liddbrook.

Mr. Musket observes, that this line of division causes the western side to dip gently to the west, and afterwards to rise again, forming on Coleford Meend a slightly inclined basin rather than a horizontal bed. At Oakwood-mill the "Coleford High Delf" is not worth working, probably from the effects of a fault. The divergence observable in the outcrop of the beds to the northward, arises from the decrease in their angle of position. The Trencher Delf begins to be workable coal about north of Bream; but its range has been traced from the clay observable in its line of outcrop; and, though of little consequence to the miner, it should not be altogether disregarded by the geologist.

At Liddbrook Valley, on the north of the coal-field, there is a contortion on each side, which throws down the High Delf coal, in one instance, seventy yards, and in two others thirty yards each (see the accompanying diagram, which is parallel with the strike, or at right angles to the dip of the beds.) The ten yards of coal comes as a covering to the coal before we reach Carter's-piece Meend, and its absence is, probably, connected with the effects of the fault, for, on showing this section to Mr. Musket, he confirmed the details, as received from a practical miner, but reversed the order, making the double contortion on the western side of the valley, and the seventy yards depression at one step, on the eastern, where this section is represented to be. In the double step the descending portions are useless coal, and represented to be dust and dirt. The local name for this contortion is "horse," whence "Horse Lea."

From Worcester Lodge, near Coleford, to Bury-hill, is a line of disturbance, the course of which is marked, on the surface, by a series of ponds, called Howler's Well, Leech Pool, Crabtree Pool, Hooper's Pool, and Hall's Pool. It is possible the water may be kept up by the clay in the fault, which is said to be 200 yards thick, extremely hard, full of siliceous wood, and, when acted on by powder, it separates without disturbing the surrounding mass, yet causes much trouble to the miner. One branch of the fault ranges to Elmwood-mill, and others are said to diverge along its course, but they have not been defined. These are the only interruptions to working the coal of any consequence, which have been ascertained; those found occasionally in other pits occur here, but they are of temporary inconvenience.

Above the "Trencher" is a bed called "the Spider," which is wrought at Gorse-hill, about a mile south of Coleford, and in no other place, as far as could be ascertained. Above the "Coleford High Delf" is the "Whittington's Delf," known also as the "Yard Coal." It is worked principally in Bream district, but is found at Dark-hill, and its clay is said to have been cut through in a shaft sunk to the west of Birch-hill Lodge, though no trace of coal was observed. From its position in the series, it is presumed to be the same bed, with that which crops out again on Carter's-piece Meend, at Nail-bridge; and it thins out on the west side of the field in the Haywood Enclosure, with several others, including the strata of sandstone in which the coal beds occur. This fact was proved by a level driven by Mr. Moses Tongue at Cinderford-bridge, from the "Churchway," one of the clay beds, to the "Coleford High Delf," without meeting with any other coal seam. At Staple-edge Enclosure the "Whittington's" is brought in again with the strata of sandstone, and is traceable thence to the Bream district.

The "Nag's-head," or "Yorkley" seam, is nearly parallel to the "Bradley" above it, and the "Whittington's" below, except in Ruedan-hill Enclosure, where the true position has not been well ascertained. The outcrop of the sandstone beds may be easily traced by the step made in the wearing away of the clay and coal, leaving a projecting hard ledge of rock. In the clay beds there is no such guide; and the information collected from the miners, and occasional traces of coal, have been relied on. As the outcrops of the clay-bed seams are faintly indicated, no attempt has been made to trace them on the surface above the "Parkend High Delf." This bed is occasionally called the "Lowery," and is well known around the field by these names. Those above it are not so generally worked, and the outcrop has not been so well ascertained. The uppermost seam, called the "Woor Green," is known only near Cinderford-bridge, or a little east of Yewtree-brake Lodge, where it has been wrought. An outcrop, near Crabtree Lodge, is supposed to belong to the same bed; and one cut through in digging the well at the "Speech-house," may be continuation of it; and this supposition is, in some measure, confirmed by the structure of the ground. The dotted line in the map defines the probable course of the outcrop.

The beds between this and the "Parkend High Delf" are commemorated by Mr. Musket's List and Section (*Geol. Trans.*, second series, vol. i., p. 286), but all endeavours to trace them around the field have been unsuccessful. An attempt has been made in the map to mark the outcrop of the principal beds of coal. Those belonging to the Black, or Lower Series, being far from each other and thicker, are best known. Where the information was obtained by personal observation, or from good authority, the outcrop is marked by a continuous line, but where the data were doubtful or conjectured, by a broken line.

The "Churchway," or "Oakwood," and the "Parkend High Delf," or "Lowery" (Lower-high?), being most worked or best known, have been selected to define the range of the upper or argillaceous beds, and the five others (according to Mr. Musket's List), which occur between them have been omitted, from the crop being confined to the intervening narrow space. Those above the "Parkend High Delf" have not been ascertained sufficiently enough to be inserted, and the "Woor Green Delf" has been dotted in, from conjecture, but after an attentive observation of the construction of the ground, with the exception of its known outcrop near Cinderford.

The stratum of argillaceous iron ore, worked near Cinderford-bridge, occurs immediately below the Trencher coal, and, probably, accompanies it round the field, though the workings have not been sufficiently extensive to prove it. In the neighbourhood of Aliberton, and towards Bream, the very uppermost, and nearly the lowest beds of the limestone, seem to be those which produce iron, but principally the uppermost. The position is marked by a line of rocky ground, some parts of which, called "scowls," are the effects of ancient excavations, and are nearly continuous from the Old Park Wood to beyond Chawwell. The limestone which occurs in the millstone grit, at Chawwell Meend, is calcareous, and partly shelly; but it is not thick, though, probably, continuous to Oakwood-mill.

The Newent coal-field, though not included in the map, deserves a brief notice. The boundary of the field is not easily defined; but its northern and western ranges may be sufficiently understood by drawing a line from Osham Church westward along the brook, to the road from Newent to Ross, a little to the west of Kiln-wood; thence it may be traced on the west of Kiln-wood, where the coal measures are well marked, and along the road to Aston Ingham, as far as the end of the wood; and afterwards by the western edge of Clifford's Mine, or Meend, to where the common

land joins the Newent Woods, and even for a short distance within the woods. At this place the coal measures appear to rest upon the transition series, but at Kiln-wood, or rather to the west of it, on the old red sandstone. The eastern side is overlaid irregularly by a conglomerate of the new red system, formed principally of siliceous pebbles; and it occasionally assumes the appearance of a bed of gravel, but in no case does it resemble the magnesian limestone. Over this bed are other similar conglomerates which alternate with strata of sandstone, dipping at a low angle (five degrees) to the eastward.

The western side of the field is composed of a fine-grained sandstone, with small quartzose particles occasionally disseminated through it; the stone is generally iron shot, and sometimes thinly laminated, and contains specks of coaly matter. At Hill-house, previous to working the coal, a boring was made to the depth of fifty yards, and the following beds were passed through, according to information received from one of the workmen employed in the undertaking:—Red clay, 30 yards (new red sandstone); sand rock, 4 feet; clod, or clay, 8 ditto; coal, 7 ditto; clod, 4 ditto; coal, 2 ditto 6 inches; clod, 15 ditto, coal, 4 ditto. The rest of the boring was through clod or clay. The seven-foot coal was the bed principally worked; but it was much disturbed, and dipped rapidly, or two feet in a yard, to the north-east or east. In 300 yards, four faults of considerable magnitude were encountered, and the coal contained a large quantity of sulphur. These circumstances, with the canal bringing the Staffordshire coal so close to the field, may have caused the relinquishing of the work. Several other attempts have been made at Bowdson Farm, about a mile to the south-west of Newent, where the coal is apparently near the surface; and, as it is said to be seven feet thick, it is probably the same bed as that which was worked at Hill-house. The fuel, however, is better, and less charged with sulphur than at that point. No engine was used, but numerous pits were dug, from which it may be inferred that unskilful means were employed to extract the coal. No attempt has been made for several years. It is possible that the nearness of this coal-field to the antichinal line, ranging from the Valley of Woodhope by May-hill to the Severn, may be the cause of the disturbances found in the strata; for the measures are so far advanced to the westward, at Clifford's Mine, as to rest upon the transition beds.

#### THE FAULT BETWEEN LYDNEY-PARK AND DENHIGH-LODGE, FOREST OF DEAN.

It has been correctly stated (*Geol. Trans.*, second series, vol. i., p. 286), that along a certain portion of the edge of the Forest coal-field the limestone is cut off by a fault. This fault extends somewhat further, though not in a completely straight line; for, near the west-end of Aliberton, where the strata, dipping with those at Aliberton Common, join the beds which dip conformably to the Blakeney range, a fault begins, separating these two dips from one another. The strata which this fault divides, in proceeding northwards, and in which three different dips appear, are, first, old red on both sides; then, after passing the chapel, old red on the right, and limestone on the left; in Lydney-park there is limestone on both sides; then, at the back of the Red-hill, the fault divides the millstone grit on the left from limestone on the right. It afterwards makes a little turn to the right, apparently just beyond the junction with the lower coal, and cuts across the end of the limestone first, and then of the upper beds of the old red, and of the conglomerate, and some of the beds under it. At the same time, the strata to the left of the fault, which are here the coal measures, change their direction, and dip thenceforward nearly as those on the right. From that point, therefore, the fault is marked by the omission of the limestone, on the surface, and not by any great difference of dip.

For some distance the strata on each side are nearly parallel to one another and to the fault (see the accompanying diagram); but after entering the forest, it is conjectured, for it is difficult to determine, from the thickness of the new plantations, that there is a sort of converse in some respects from that which occurs near Lydney; for while the coal measures, *d*, continue to range parallel to the fault, the upper beds of the old red, *a*, which had been cut off near Lydney, gradually and obliquely come in again, as inferred from the dip; and then, at Denhigh-lodge, the fault turns for a short distance at about 45° to the left, and cuts across the end of the conglomerate, *d*, the beds above it, *a*, and the limestone, *b*, which are thus restored to the surface at the valley of Blackpool Brook. It is presumed that, at this spot, the fault returns to its former direction, and does not terminate, for the millstone grit is not restored at this point, though the limestone, *b*, is, but gradually appears farther on, *c*. Though, in one sense, the fault which exists near Aliberton may thus be considered as continued into this great fault from the Leech Pool to beyond Denhigh-lodge, another description of continuation of it, is in the line or axis which runs into the coal-field through the successive points of acute flexure made by the different beds or "delves" of coal. This flexure or irregular basin shape seems here moulded by the two unconformable dips of the old red, which the fault at Aliberton divides; but they seem to bend from one position to the other less abruptly, and with less dislocation of the strata, than near Aliberton. It is suspected, however, that at the bend of the upper coal beds at Whitecroft, there is some little dislocation; and, very possibly, near Lydney, the Coleford High Delf does not bend so completely without dislocation, as it is represented to do in the map.

In that part of the line where the fault runs nearly parallel to the strata on both sides, it has not been found possible to distinguish clearly one formation from the other, or, consequently, the exact line of dislocation. The characters of the millstone grit and old red are likewise not well defined. A remarkably hard, fine-grained, purplish rock occurs, in white clay, at Old Croft, also at a spot further on in the Forest, and a similar rock appears near Bream. It sometimes contains quartz pebbles, and is, possibly, a variety of millstone grit. It has a slight mixture sometimes of calcareous matter, and limestone itself is here occasionally subordinate to the grit. Its position, however, partakes somewhat of the obscurity, already mentioned, respecting this line of fault, from the Leech Pool, near Lydney, to Old Croft, in the Forest.

**FIRST USE OF COAL AS FUEL.**—It is understood by coal miners that no distinct period can be ascertained when coal was first used for fuel in any part of England. By the proclamation of Edward the First, and again in the reign of Queen Elizabeth, we find coal was prohibited in London during the sitting of Parliament, lest the health of the Knights of the Shire should suffer during their residence in the metropolis; it appears, however, from a charter of Edward II., dated 1315, that the coal of Derbyshire was in use, and that the Lord of Alfreton, Thomas de Chaworth, granted to the monks of Beauchief Abbey, near Sheffield, permission to supply themselves from his domains of Norton and Alfreton, in Derbyshire.

**ATMOSPHERIC AIR.**—Mr. Clarke, of Whitehaven, delivered a lecture on the subject of atmospheric air in that town on Wednesday week; the lectures began by pointing out the importance and utility of an acquaintance with the atmosphere around us, which bears so very important a part in all our enjoyments, and is so absolutely essential to life itself, and then proceeded to show the materiality of the atmosphere, which he did in so clear and satisfactory a manner that the conclusions arrived at must have been obvious to every mind. The weight, compressibility, and elasticity of air were next considered; after which followed an inquiry into the general pressure of the atmosphere, and an explanation of the construction of the common barometer, concluding with some exceedingly interesting remarks on the rarefaction and condensation of air. The language of the lecturer was clear and classical throughout, the illustrations apposite, the deductions at once logical and striking, and the experiment interesting and instructive.

\* At Chawwell Meend, near Coleford, the limestone is worked in two places in the millstone grit, and small pieces have been dug out at Old Croft, bearing the red sandy appearance of that at Chawwell Meend.

#### SPECIFICATIONS OF RECENT PATENTS.

##### IMPROVEMENTS IN MACHINERY FOR THE PRODUCTION OF ROTATORY MOTION, AND IN LOCOMOTIVE ENGINES.

Joseph Woods, civil engineer, late of Lanes-place, Lambeth, but now of the Vulcan Foundry, near Warrington, Lancashire, for certain improvements in locomotive-engines, and also certain improvements in machinery for the production of rotatory motion, for obtaining mechanical power; which improvements in machinery are also applicable for raising or impelling fluids, Nov. 22.—The first part of this invention relates to locomotive-engines.

The first improvement under this head consists in using loose wheels with locomotive-engines, to enable them to travel round curves more easily. One of each pair of wheels belonging to the front and hind axles of the engine is fastened on its axle, in the usual manner, whilst the other wheel is allowed to turn freely on the opposite end of the axle.

The second improvement consists in a means of lubricating the end bearings of the axles. In a recess underneath the end of the axle, a small roller is partially immersed in oil, or other lubricating matter, and which being turned round by the friction of contact against the axle, carries up and distributes a continuous supply of oil to the periphery of the same, as it revolves.

The third improvement is applied to the "reversing gear" of the engine, and consists in the use of one reversing shaft, to act simultaneously upon both eccentrics rods and forks, and bring them into or out of gear with the weigh-bar pin; and also in the manner of applying the bearings of the weigh-bar shaft. The reversing shaft has two arms or levers fixed on it, at an angle to each other, the ends of which are connected by suitable links to the forked extremities of the rods of the eccentrics. Another arm also projects from the reversing shaft, and is connected by a rod to the handle under the command of the engine-driver.

The fourth improvement consists in placing a whistle in the front or other part of the engine, connecting it with the blast-pipe, or to one end of a cylinder, by means of a tube, for the purpose of giving a constant intermittent whistle or signal, when the engine and train are travelling along the line during a fog, or when any obstruction is offered to the required speed of the engine in travelling.

The fifth improvement consists in the peculiar arrangements and construction of the swivel or union joints of the pipes which convey the water from the tank in the tender to the engine.

The second part of this invention consists in an improved arrangement of the parts of that description of engines commonly called "rotatory disc engines." Through the centre of the spherical case of the engine an axle passes, on the centre of which, at right angles to its axis of motion, a circular disc plate and ball, termed the diaphragm of the engine, is fixed, the periphery of the disc plate being in close contact with the spherical case, and to the centre of this diaphragm one end of a piston is attached by its axle. The piston is placed at right angles to the diaphragm, and oscillates endways through a slot, formed in it from its centre to its circumference. A channel or way is formed at each side of the slot (one end of each channel opening into the same, on either side of the piston) passing from thence into the ball, where one channel turns to the right, and the other to the left, and emerging from the ball, continue as channels formed on the main axle to the admission and exhaustion chambers respectively.

In the spherical case are two stationary conical surfaces, or side pieces, which are placed in such a manner, that one portion of each side of each cone will be perpendicular to the main axle, and in contact with the diaphragm on opposite sides of its substance, and also on the opposite sides of the axle; and, moreover, when a portion of one side of the diaphragm is in contact with one cone, the opposite cone is at its greatest distance from the other side of that portion of the diaphragm. The apex of each cone is removed, and cupped, so as to fit the centre ball of the diaphragm, and its ball being consequently subject to wear by friction, is made of a separate piece of metallic packing, adjusted by springs, or other means. The back parts of the cones are hollowed out into chambers for the induction and eduction of the steam or other fluid. The space between the cones for the piston to travel in, is divided by the diaphragm into two equal parts, which are each of the form of a double wedge, joined at the base, at that part where the cones are furthest from the diaphragm, and the piston is made of the form or section of the entire space. The steam being admitted into the induction chamber, proceeds along one of the channels in the ball and diaphragm, and passing out at the opening in the slot, impinges directly on the piston, and forces it round, together with the diaphragm and main axle. As the piston travels onwards, sliding over the sides of the cones, it oscillates through the slot in the diaphragm, according as the space on either side of the same increases or diminishes. This machinery is also applicable for raising or impelling fluids, by causing its axle and piston to be driven round by any independent power, and adjusting its induction and eduction apertures to the pipes required for conveying the fluid to and from the machine.

##### IMPROVED PROCESS FOR THE PRODUCTION OF HEAT.

James Colley March, surgeon, Barnstable, Devon, for certain improved means of producing heat from the combustion of certain kinds of fuel, Dec. 8.—These improved means consist in impelling a sufficient quantity of atmospheric air streams downward, upon the surface of the coals in furnaces, instead of allowing it to ascend through fire-bars in the ordinary way. This principle is first shown as applied to a stationary boiler; beneath the boiler, instead of the ordinary fire place, there is a deep cavity filled with coals, called the coal chest, its bottom being a plate furnished with two toothed racks and guide bars, so as to be raised to the top of the cavity as the fuel is consumed. This plate is furnished on each side with hinged flaps, which lie close against the sides of the cavity, and prevent the coals from escaping. In order to guard against the jamming of the coals, the cavity or coal chest is made a trifle larger at top than at bottom; a difference of one inch each way being said to be sufficient for a coal chest four feet deep. A main pipe connected with a revolving fan, or other suitable blower, passes in at the front of the boiler, through the bottom of which short tubes project downwards, which direct the streams of air upon the surface of the fuel. The furnace is lighted by placing live coals, or chips, shavings, &c., on the top of the fuel, and passing a moderate stream of air down upon it, when the surface becomes perfectly ignited all over in about five minutes; and the stream of air being increased, perfect and smokeless combustion goes on at the surface of the coals. As the fuel is consumed, it is raised by a couple of wheels and pinions, which work in the racks of the plate upon which the coals are supported. The same principle is shown with such modifications as are necessary to adapt it to locomotive and to marine steam-boilers; in the former case the fan is placed within the water space of the tender, and driven by a belt from one of the running wheels; the coals are raised by two screws, one right handed, the other left, worked by cogged wheels, placed beneath the coal chest. The patentee states, that 975 cubic feet of atmospheric air are required in this furnace to evaporate one cubic foot of water. The jet tubes from which the air is driven upon the burning fuel, vary from three-quarters of an inch to one inch and a quarter. Sixteen tubes, one inch in diameter, evaporated twenty cubic feet of water per hour. The tubes are found to be most advantageously disposed, when placed at intervals of about nine inches from each other. The patentee excepts anthracite coal from the fuels adapted to this method of combustion, and proposes, when a strong flame is required, to introduce some combustible fluid (as coal tar) with the streams of air. The fuel immediately beneath each jet burns into a hollow, which is to be levelled, and any clinkers that may form, to be removed, by an iron hook, through a door provided for that purpose. The fuel is not to be used in pieces larger than an orange, and is to be mixed with small coal to fill up the interstices. The claim is to the mode of obtaining combustion of coal by causing streams of air to be blown, and caused to impinge on the upper surface of such fuel, without passing through the general body of coal below the ignited surface.

##### NEW PATENTS FOR DECEMBER.

W. H. Fox Talbot, Esq., Laycock Abbey, Wilt., for improvements in coating or covering metals with other metals, and in colouring metallic surfaces.  
John Hall, sugar refiner, Brecon Hill, Radnorshire, for improvements in the construction of boilers for generating steam, and in the application of steam to mechanical power.  
Charles Lomer, civil engineer, Half moon-street, Finsbury, for improvements in steam engines, and which improvements are also applicable in raising or forcing water, and propelling vessels.  
John Board, motion spinner, Overton, Halifax, for an improvement or improvements in condensing steam-engines.  
William Edward Newton, civil engineer, Chancery-lane, for certain improvements in lamps and burners, and in the means of supplying air and heat thereto for the support of combustion—being a communication.

**MUSEUM OF ECONOMIC GEOLOGY.**—Although nearly two years have elapsed since this great national collection was commenced in formation, at least twelve months more will elapse before it will be opened to the inspection of the public. The house, No. 5, in Craig's-court, is fitting up for the museum, and the adjoining, No. 6, for the repository of mining records; the former being under the direction of Mr. De la Beche, the Government geologist, and Mr. E. Phillips, who will have charge of an extensive laboratory for the analysis of soils, &c. Five rooms are being fitted up with cabinets, and amongst the specimens already in the museum are the whole of those of some collected by the commissioners appointed to inquire into the best material for the construction of the two Houses of Parliament, with many others collected in the Ordnance surveys, and gifts from many private sources, as well as duplicates from the British Museum.

**CANALS IN ENGLAND.**—According to a calculation recently made there are 180 canals in Great Britain, extending 2082 miles, formed at an expense of 20,000,000*l.* sterling.

\* This line is nearly parallel to what is assumed to be the line of greatest depression, at several line of the field of Dean, which runs to the north at about 14 deg.



[illegible][illegible]



**EAST TRETOIL MINING COMPANY.**—The directors hereby give notice, that all shares in this company whereon the First Call of Five Shillings per share (due on the 14th day of April last) shall remain unpaid after the 1st day of January next, will be absolutely FORFEITED. And the directors hereby give further notice, that all shares whereon the Second Call of Five Shillings per share (due on the 25th day of October last) shall remain unpaid after the said 1st day of January next, will also be absolutely FORFEITED.

By order of the Board, S. EUSTON, Sec.  
East Tretoil Mining Office, 6, St. Michael's-court, Dec. 15.

#### MEETINGS OF SCIENTIFIC BODIES. IN THE ENSUING WEEK.

SOCIETY.	PLACE OF MEETING.	DAY.	HOUB.
Zoological	57, Pall Mall.	Tuesday	8½ P.M.
Royal Asiatic	14, Grafton-street.	Saturday	2 P.M.
Mathematical	Crispin-street, Spitalfields.	Saturday	8 P.M.
Westminster Medical	Exeter Hall.	Saturday	8 P.M.

#### PUBLIC COMPANIES.

COMPANY.	PLACE OF MEETING.	DAY.	HOUB.
Bridgend Railway	Wyndham Arms, Bridgend.	Dec. 27	11.
Puget's Sound Agricultural Co.	4, Fenchurch-street.	29	2.
Boliver Mining Association	9, Warford-court.	30	12.
Bahia Steam Navigation Company	George and Vulture Taverns.	31	12-1.
Colonial Bank	London Tavern.	Jan. 4	12-1.
London Dock Company	Dock House, New Bank-buildings.	4	1.
Imperial Fire Office	80, Court, Cornhill.	4	1.
Royal East India Dock Company	38, Broad-street-buildings.	5	1.
Yankee Water Works	Office, Kensington-lane.	5	12.
Northern and Eastern Railway	London Tavern.	6	2.
Reverendary Interest Society	17, King's Arms-yard.	6	12.
East and West India Docks	Dock House, Billiter-square.	7	2.
London Joint-Stock Bank	Office.	12	11-12.
Provincial Bank of Ireland	47, Old Broad-street.	13	12.
Wherry Mining Company	Union Hotel, Penance.	18	11.
Bank Mining Company	Office, Gresham.	20	11.
S. Metropolitan Gas-Light & Coke Co.	Three Tuns Tavern, Borough.	24	11.

COMPANY.	PLACE OF MEETING.	DAY.	HOUB.
Cambrian Iron and Spelter Co.	24, Dec. 29	London Joint-Stock Bank.	Jan. 1.
West of England Mining Assn.	19, Jan. 31	London and Westminster Bank.	1.
Northern and Eastern Railway	5, Jan. 31	Masterman and Co.	1.
South Eastern Railway	5, Jan. 31	Glyn and Co.	1.
London & Birmingham Railway	10, Jan. 31	As former calls.	1.
Irish Waste Land Im. Society	11, Jan. 31	As former calls.	1.
Southampton Dock Company	14, Jan. 31	London and Westminster Bank.	1.
South Australian Banking Co.	24, Jan. 31	Corrie and Co.	1.
Royal Mail Steam-Packet Co.	14, Jan. 31	As former calls.	1.
Rio Doce Company	14, Jan. 31	Union Bank of London.	1.
Irish Waste Land Im. Society	14, Jan. 31	As former calls.	1.

COMPANY.	PLACE OF MEETING.	DAY.	HOUB.
Lehigh Coal & Navigation Co.	As usual	London Joint-Stock Bk.	Jan. 1.
Bank of British North America	24, per share	Bank	1.
Tamar Silver-lead Mining Co.	14, per cent.	Office	10.
East London Water Works	14, per cent.	Office	10.
National Bank of India	14, per cent.	Bank	10.
National Provincial Bk. of Eng.	14, per cent.	Bank	10.
Southwark Bridge Company	14, per cent.	Office	10.
Mexican and S. American Co.	14, per share.	Office	10.

#### NOTICES TO CORRESPONDENTS.

The insertion of several valuable papers are necessarily postponed, all which shall, however, appear in our next.

"A Workman" is under consideration.

MINE SURVEYING.—Several letters are postponed.

The communications of Mr. U. Thompson ("Improvement on the Patent of Mr. Player, for Using Stone Coal in the Smith's Fire") "Vindex" on the Durham County Coal Company—Mr. Tregaskis—A. T. J. Martin—"An Inquirer"—"A Coal Miner," &c., shall be published in next Journal.

We have not received the promised communication of "D. K."—Fals.

In consequence of the numerous applications made to the Editor on subject of *Admiral's* *Memorials* which have appeared in the columns of the *Mining Journal*, with reference to articles or materials used in the working of mines and the construction of railways, arrangements have been made for the publication of all information necessary to be acquired on application of the office of the Journal, as also reference made to the various maps, plans, drawings, and specifications, and where questions may be sent, if being intended to devote a room to that express purpose. It is further announced, that measures are in course of being taken for rendering the office of the *Mining Journal* the medium of acquiring information on all matters connected with mineral property, where plans and particulars of mines and mining materials for disposal may be consulted and obtained. Experienced agents in the several mining districts will undertake surveys and furnish plans, sections, and reports, on mineral property and mining undertakings.

## THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, DECEMBER 25, 1841.

The present Number closes the current year, and completes the **SEVENTH VOLUME** of the *MINING JOURNAL*. It is not necessary for us to enlarge on the usefulness of a publication of this nature, when conducted with ability and honesty of purpose, while the increasing value of the work is manifested in the valuable and interesting correspondence which is weekly drawn forth from our valued and valuable correspondents, without whose aid we should lack the ability, although we should still claim for ourselves honesty of purpose. The Index, which accompanies the present Number, is the best evidence we can submit as the test of our exertions in rendering the columns of the Journal useful, instructive, and interesting. Several subjects of the first importance have been treated upon in a practical and scientific manner, eliciting many new theories and facts; and other contributions of a scientific character, although not strictly appertaining to mining, have created an interest with the more general reader, while the proceedings of scientific bodies have been carefully introduced. The hearings and decisions in courts of law, on subjects connected with Joint-Stock Companies, and the Parliamentary proceedings, have established the *MINING JOURNAL* as a useful record, while copious reports of the proceedings of public companies, more especially Mines, Railways, and Joint-Stock Banks, have been given from time to time, forming a valuable Journal of reference.

We deem it unnecessary further to advert to the contents of the Journal, or, indeed, to add more than to convey, through this medium, our best thanks to those who have so ably assisted and supported us by their contributions of the several valuable papers and correspondence which have appeared during the past twelve months, justifying us fully in asserting that the present volume may vie with either of its predecessors. To their continued zealous assistance we look forward; and while our thanks are equally due to our subscribers for the support they have afforded us by contributions in another and a different shape—we can only say, and wish with sincerity, to "one and all," a "Merry Christmas and a happy New Year!"

We had compiled some few observations on the state of the sulphur trade, the prospects of our home mines, and the manœuvres of his VOLCANIC MAJESTY, but being anxious to acquire more precise information than that now before us as to the intention of the KING of the TWO SICILIES remitting the entire export duty on sulphur from his dominions, we defer their insertion until we are better informed on the subject. We cannot, however, allow an act on the part of our Government in favour of the SICILIAN KING (and which was noticed in our City news of last week) to pass by without remark—we refer to the reduction of about 50 per cent. on our import duty upon olive oil from Sicily—thus giving to the Neapolitan Government an advantage which we

should hope is reciprocated in some shape. It is quite clear, however, that the miner is not likely to benefit by this reciprocity system, for we are, at the same time, given to understand that the KING of the TWO SICILIES intends to remit the whole duty of 4l. 10s. per ton, which was imposed on sulphur exported from Sicily, instead of reducing it to about 1l. 14s., which was to come into force on the 1st January, 1842—in which case, we must confess, we should despair of our home sulphur mines being worked, and hence the heavy losses which would necessarily be sustained by their abandonment, while the English manufacturer would be left unprotected. We trust that some Member of the House of Commons will direct his attention to the subject, and while we reduce a duty on an article which is not indigenous to our soil, we may be allowed to protect our home products, and that, by a fair import duty being imposed on foreign sulphur, our mines at home might secure that protection to which they are so fairly entitled.

We are glad to learn that a general report on the situation of the miners in Belgium is now preparing in the office of the Minister of the Interior, with the view of such measures being adopted by the Government as may appear necessary for the amelioration of the condition of that body—provision being contemplated for cases of accidents, which are said to be numerous, the accounts for several successive years showing the average number of deaths annually to exceed one hundred. In addition to several proposed measures which will be submitted to the Government, the apportionment of a certain sum annually, for the instruction of the children of miners, will form one of the main features of the report, which will, doubtless, contain much valuable information connected with the mining industry of Belgium, in which from 35,000 to 40,000 are said to be employed. This report will form valuable data for the consideration of the Polytechnic Society of Cornwall, as to the best means of adopting a similar system in that county. In Belgium we find that the Government put themselves forward as the protectors of the working miner; in England private beneficence is all that the miner has to look up to, while the only asylum in his old age to which he can repair is that of the "Union." Would that things were altered, but, as example is before precept, we can only hope that, in this particular, at least, our Government will take a lesson from our continental neighbours.

A meeting of the proprietors in the Marylebone Joint-Stock Bank was held during the week, when a further *expose* took place of the misconduct (to use a mild term) of certain parties connected with that establishment, and the culpable neglect of others. The directors, it will be seen by the report of the proceedings, have completely forfeited the confidence reposed in them by the shareholders, who decline further to intrust them with their monies—a matter at which no one can be surprised, when it is remembered that they allowed the managing (!) director to embezzle a large amount, and sanctioned a false statement of the affairs of the company to be put forward, wherein no less a sum than 11,715*l.* was overstated as paid-up capital. It is not twelve months since that the board of directors, despite the defalcation on the part of Mr. HANNAY, and the misrepresentations made as to the paid up capital, actually declared a dividend of 4*l.* per cent. out of the profits—the bank then being in an insolvent state. It may be naturally asked, Were there no auditors? Were not the books balanced? Were not the vouchers, and other documents, compared and entered, to ensure the accuracy of accounts so important as those of a banking establishment, more especially when the directors were merely the representatives, or delegates, of the body of shareholders? We fear, with the exception that there were auditors who neglected the rigid performance of their duties (for we cannot suppose a bank to be established without those offices being filled, whether nominally or otherwise), that there can be no doubt but the balance-sheet was assumed to be correct; one half hour, in all probability, effected that which would have required days of assiduous attention, and which it should have received. This system is not, however, confined in its application to the Marylebone Joint-Stock Bank; we could name several joint-stock undertakings where we know the auditorship to be a mere farce, while, in other companies, the directors contend that the only duties of an auditor are to see that Dr. and Cr. sides are properly cast, and the balance regularly brought down. We contend that the duties of an auditor are of an onerous nature; there is a responsibility devolving on the holder of that office, which it is his bounden duty to uphold in the performance of its functions, and for which he is liable to his constituents to answer. Let, then, the shareholders in public companies pay well their auditors, who should be men fully equal to the office, whether shareholders or otherwise, for it matters not (indeed, perhaps, if indifferent parties the better), and directors would be "up and stirring," they would not display the apathy which has been the ruin of so many concerns, but would earn the money, in many cases, so fruitlessly expended in the payment of directors' salaries, and who, in nine cases out of ten, act but as a "drag upon the wheel."

#### LONDON GEOLOGICAL SOCIETY.

At the meeting held on the 15th inst., a copy of the great Geological Map of France, by M. Dufrenoy and M. Elie de Beaumont, was presented to the society by the president in their name. In doing so Mr. Marchant read the following letter, which he characterised as containing the highest compliment which had been paid to the society since his connection with it.

Monsieur le President,  
Nous avons eu l'honneur de vous adresser il y a peu de jours un exemplaire de la Carte Géologique de la France, et du premier volume de l'Explication, qui doit l'accompagner. Nous vous prions de vouloir bien l'offrir en notre nom à la société. La découverte avec laquelle nous avons été accueilli par la société et par plusieurs de ses membres, lors du voyage que nous fîmes en 1835 en Angleterre pour en étudier la géologie, nous fait espérer qu'elle accueillera également avec indulgence le travail qui nous lui présentons. Nous n'oublierons pas que les belles découvertes faites en Angleterre ont été les premières à nous servir de modèles dans l'exploration que nous avons faite de la France, et nous remercions les membres de la société, qui ont bien voulu nous faciliter à l'égard de la géologie Anglaise de l'appui qu'ils nous ont prêté dans nos travaux.

Enchanté.

Elie de Beaumont.

[A Description of the Remains of six species of Marine Tuffe (A. de Beaumont) from the London clay of Shropshire and Warwickshire, communicated to the society by Prof. Green, F.R.S., shall be published in an early Number.]

#### MR. VIGNOLE'S LECTURES ON CIVIL ENGINEERING.

On Wednesday, the 23d inst., Professor Vignoles delivered his 5th lecture "On Civil Engineering," at University College.—The present lecture was wholly on earthwork. He commenced by stating that earthwork, taken in the present extended sense of the word, was but little known to the ancients. The gigantic operations in earthwork of modern times correspond with the vicissitudes of the ancients. Our earthwork may be confined to excavation, cutting, and embankment, or getting and filling, as ordinarily denominated by contractors. He then went through the whole process, giving the scientific and common names of each description of work. With respect to the works of the ancients, in the canal made by Cyrus, the Phœnicians were the only workmen who cut the canal with slopes—all the rest employed cut straight down, and, in consequence, the former stand, while the latter fell in. The River Po, in Italy, was a curious instance of embankment; this river is situated in a very flat country, and makes an annual deposit of a calcareous matter, which, hardening, raises the bed of the river in a slight degree every year. The ancient inhabitants, to prevent their country from being inundated, were obliged to raise a small embankment on each side of the river—perhaps two or three feet high—which having served for some years the desired purpose, and the bed of the river having become higher from the deposit, the embankments required to have still more added to them, until, after the lapse of centuries, the bed of the river, from the constant deposit of calcareous matter, and the consequent necessary additions to the embankments, to the height of thirty feet, is now several feet above the level of the surrounding country. This work looks like one of our modern gigantic works, but it bears no comparison to the labours of the present day, it being but a work performed from year to year, in small portions at a time, while ours have been formed at one operation. From all his researches, he, therefore, came to this conclusion, that, until late years, earthwork was but little known; he could make the same remark with respect to cutting. This work was first treated systematically by military engineers in fortifications on the continent after the invention of cannon; authors of that period lay down many curious rules for forming ramparts. Various useful calculations are given to determine the best mode of making the matter taken from the ditch exactly sufficient to form the rampart, in order that there should be none either to procure or carry away. Then next is in the construction of canals; the same rules were followed as in the construction of ramparts. In road-making the same calculations were made; the whole aim of the engineer being to make the imaginary line, called the "balancing line," so perfect, that the earth removed from the eminences should fill up the hollows in the irregularities of the country through which the road was to be made. The cause of these far calculations was the difficulty and expense of carrying away the superfluous earth to another place. The absence of great undertakings on the continent is attributable to the want of our modern appliances to get rid of the superabundant matter. In the contracts sent in by foreigners for works abroad, it is amusing to see the fiscal exactness with which the contractors calculate the expense of removing the first 100 yards, then the next twenty-five yards, and so on increasing until they get to 300 yards, beyond which the price is enormous. It is only within the last three years that they seemed to have the slightest idea of the plans in use in England for facilitating this work; it is certainly not more than thirty years ago that we commenced using the tramroad. First of all the only plan was to remove the earth in barrows, then the clumsy three-wheel cart was introduced, after that tramroads, and now edge-rails, with the application of a locomotive, so that thirty years has changed the load from two and a half cubic yards to nearly 100. Before railroads came into general use, deep cuttings were executed, and one remarkable instance Telford has left behind him in the Birmingham Canal, which is remarkable for boldness of idea and success of execution. Near Market Drayton there is an embankment, begun fifteen or sixteen years ago, and which is not yet hardly finished, so great has been the slipping and so difficult the remedy. This work is a remarkable instance of combined bad effects of a bad mixture; the slopes have flatted down until nearly in the proportion of fourteen to one, and it is now more like a large hill than an embankment. There is an instance of a deep cutting, by Dodd, at the Highgate Archway; it was intended, first of all, to make a tunnel, but, from the constant slipping of the earth, it was obliged to be made into an open cutting. The present bold mode of cutting down large hills and filling up deep valleys, in the formation of railways, is due to George Stephenson, and in the construction of large cuttings and embankments for canals to Telford, whilst Dodd made the largest cuttings for roads. On the Holyhead-road the failure of the embankments and cuttings in the London clay will teach a good lesson to the young students. The point to be considered is, which, of masonry, aqueducts, tunnelling, embankments, or cuttings, would be the cheapest mode of doing the work proposed. At the present time earthwork is the cheapest, for modern practice has reduced it to a price per cubic yard. In the contracts for the Paris and Rouen Railway the contracts sent in by the French engineers were invariably three or four times the amount of those sent in by English contractors—thus, notwithstanding the expense of transporting the workmen into France, the whole of that work is in the hands of Englishmen. The engineer, to form a just calculation, must well study the character and mechanical properties of the soil and the necessary slopes. Experience alone can teach these points. There are many varieties of the London clay, which, when cut down to a certain depth, on exposure to the atmosphere are sure to slip; another cause is, the great haste with which the embankments, &c., are formed. When the water does not penetrate, the clay is very hard, but after exposure it melts away, like tallow, and the only remedy is to get rid of the water by draining. When a slip takes place, the toe of the embankment bulges forward; in the first instance, the surface should be well drained, a short distance from the edge—the drain to be puddled, in order that the water should not penetrate; borings should be made horizontally and the water tapped; when expense and time are no objects, the whole should be cut in steps, and drained by means of wattles, so that, if a slip takes place, it is only partial. The force with which the toe of the embankment bulges out is such that a wall of masonry would be of no use, as it would be pushed out; the most effectual preventive, or remedy, is wattling and bush drains. When time will allow, it is better to make the embankments in layers, and between each layer of earth putting in a course of brushwood, clippings of hedges, or wattlings. When embankments are obliged to be poured out hastily, allow them to take their natural slope, and if it slips let it remain, for however much it may be attempted to reduce it to its former shape, it will still again slip and regain its position. A good practice to provide against slips is to form a slight abutment of earth, a short distance from the toe of the slope, so that it should stay the slip if it takes place; this plan is more particularly available when the work is obliged to be erected on a natural slope—for instance, on the side of a hill. The learned Professor, then, for the information of the younger students, explained, by diagrams, the nature of slopes, and the meaning of the expression "two feet to one," &c., and concluded by recommending that, in forming slopes, the engineer should run some risk of slips, in order to save the great expense of removing more earth than is actually necessary—the cost of repairing three slips being but little in comparison. He likened the work to an insurance on life—the risk to be run being calculated upon by precedents. The principle is to get the greatest extent of work finished at the least possible expense, and many of the great slips that have taken place might have been prevented, or speedily cured, had the plans he laid down been better followed.

The next two lectures will be a continuation of the same subject.

[This instructive and interesting course of lectures will, we have reason to believe, be considerably extended, from the increasing interest manifested on the subject, which is so ably treated by the talented lecturer.]



## ORIGINAL CORRESPONDENCE.

## REMARKS ON MR. CHARLES HOOD'S PAPER "ON THE PROPERTIES AND CHEMICAL CONSTITUTION OF COAL."

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Having observed, in a former letter, that there were several chemical errors in Mr. Hood's paper, that gentleman has, through your columns, called on me to point them out. As I prefer, on all occasions, giving a higher authority than my own, I here refer to that of Dr. Kane, and have to request your insertion of the accompanying letter from that gentleman, rather than going over the same ground myself. Mr. Hood's paper, though containing much of what I had given in my *Treatise on the Combustion of Coal*, was yet so directly at variance in many respects, both as to fact and principle, that I felt bound either to alter my own statements, should they prove to be erroneous, or observe on those of Mr. Hood. This was the cause of my requiring Dr. Kane's opinion. I propose hereafter following up the matter through your columns, and commenting on those parts which in my opinion are erroneous or objectionable, and which Dr. Kane has not noticed, as he had access merely to the monthly minutes of the Institution of Civil Engineers, and not to the paper itself.—*Liverpool, Dec. 20.*

C. W. WILLIAMS.

## OBSERVATIONS ON MR. HOOD'S PAPER.

BY DR. KANE.

In reply to your inquiries respecting the details in Mr. Hood's paper, presented to the Institution of Civil Engineers, I have to observe, that there are several inconsistencies in it, a few of which I will point out. First, the light carburetted hydrogen is not among the first products of the distillation of coal; but it is formed, on the contrary, only when the volatile resin-oils and the clefiant gas (which are, in reality, the first products) are decomposed by sweeping over the ignited surface of coal, or metal of the retort, or its contents. When clefiant gas is passed through tubes heated to bright redness it deposits half its carbon, and, without changing its volume, is converted into light carburetted hydrogen. If it be frequently passed backward and forward through the tubes, it deposits all its carbon, and the residual gas (the volume of which is doubled) is found to be pure hydrogen. The products of the distillation of coal may be arranged according to the temperature at which they may be produced, as follows:—

1st. Lowest temperature. Solids, as naphthalene, solid resin, and fluids with high boiling points.  
2d, or next temperature. Fluids which are very volatile.  
3d stage. Clefiant gas.  
4th stage. Light carburetted hydrogen gas.  
5th, or highest temperature Hydrogen gas.

In practice, however, the results of two or three stages are always mixed together.

2d. Light carburetted hydrogen is more difficult to inflame than clefiant gas (Mr. Hood's paper states the reverse). Davy has fully proved this, and I have verified his result, that a mixture of air and clefiant gas will explode at a temperature that will not produce action on a mixture of air and light carburetted hydrogen.

3d. The heat produced by clefiant gas, in burning, is greater than that produced by the combustion of the same volume of light carburetted hydrogen in the proportion of 7 to 16. The weights are those, however, as their specific gravities—that is, as 16 to 25. If we plunge a piece of bright red charcoal, or a bright red iron rod, into a mixture of clefiant gas and air, it will explode; but we may immerse the charcoal and iron, white hot, into a mixture of light carburetted hydrogen without any danger. The whole use of the safety lamp depends on this.

4th. Mr. Hood is quite in error respecting the source of the ascensional power of gas and its law; it has nothing to do with the law of tranquil diffusion into space, with which he has confounded it.

5th. He is also wrong respecting the source of the great heating powers of the resin fuel. The idea of an increased draught from the quantity of vapour formed is also quite incorrect.

6th. There is nothing gained by the production of a gas requiring less oxygen (as Mr. Hood supposes) than clefiant gas does, for there would then be less heat produced. The quantity of heat evolved in the burning of any body is proportional to the quantity of oxygen absorbed, and it is hence the interest of the operator to use as much oxygen as possible, instead of the reverse. With regard to the law of the quantity of heat evolved being proportional to the quantity of oxygen consumed, the following extract, from the article "Combustion," in my *Elements of Chemistry* (more than 20 years ago), will be sufficient to explain it.

"The determination of the quantity of heat produced during the combustion of a given quantity of a combustible substance is a problem of great importance in the arts, as on it depends the economic value of all varieties of fuel. The plan generally followed has been to burn the substance, by means of the smallest quantity of air which is sufficient, in a vessel surrounded, as far as possible, with water. If it be found that the burning of a pound of wood heats 27 lbs. of water from 22° to 21°, no idea can be thereby formed of the quantity of heat evolved. But if, in another trial, it be found, that the burning of a pound of charcoal raises the temperature of 24 lbs. of water through the same range, it follows, that the charcoal has double the calorific power of the wood. True relative numbers can thus be obtained, although they have, independently, no positive significance. The results obtained in this way, by various experimenters, have been exceedingly discordant, but, by the late researches of Despretz and of Bull, a very interesting rule has been obtained. It is, that in all cases of combustion the quantity of heat evolved is proportional to the quantity of oxygen which enters into combination. Thus Despretz found that there are, heated with hydrogen, 29 lbs. of water.

giving, as a mean, 24 lbs. as the quantity of water heated from 22° to 21° by the heat evolved in the combination of the pound of oxygen. This rule, however, is liable to some very curious changes."—*Dr. Kane.*

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Since I last addressed you on the subject of Mr. Charles Hood's call on me to point the errors which I had alleged were contained in his paper on the properties, &c., of coal, read to the Institution of Civil Engineers, I have received a post letter from that gentleman, and hasten to reply to it, through your columns, as I most respectfully decline converting a purely scientific inquiry into a personal altercation.

Mr. Hood calls on me, directly, to acknowledge the errors into which, he asserts, I have fallen, and, as one gentleman would to another, while, at the same time, he declines to point them out. I can only say I have again read his paper, and reassert that, in my opinion, it contains several chemical and practical errors, and, as I have already said, I will in due time point them out. Mr. Hood observes, that he has also written to Dr. Kane, calling on him for a retraction of his errors on the same subject. That learned professor, no doubt, will be able to justify himself. The questions under consideration being strictly chemical and practical, I conceive it to be a matter of perfect indifference to the public, whether Mr. Hood or Mr. Williams be right, as regards the personal matter; but it is of very great importance which class of facts be the right ones, and, as neither of us should be the judge of our own views, we must both await the tribunal of public opinion. Your insertion of this letter in your next Journal will oblige, Your's, &c.,

Dublin, Dec. 21.

C. W. WILLIAMS.

## THE STEAM-ENGINE—ECONOMY OF FUEL.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Probably, in no other periodical can public discussions be found more generally interesting to a manufacturing district than some I have lately observed in the columns of the *Mining Journal*—I allude to the questions connected with the steam-engine, and to the economy of fuel, both in its production and application. In the latter respect, I have paid particular attention to the various communications of Mr. Williams, on his theory of perfect combustion, and I am afraid, that, however true essentially—or, rather, chemically—correct he may be, he is half inclined to shirk the great question of economy of fuel, or, at least, judging from his answer to an "Inquirer on the Spot," he would make it only a secondary consideration. Now, in the present unusually depressed state of trade, it is anything but a secondary consideration—in this district at least.

The preventing the nuisance of smoke is undoubtedly an object of importance at all times; but at the present, when the employer's profits and the operative's wages are cut down to a minimum, it is an object of immeasurably small importance compared to the saving of fuel. In reference to this part of the subject, I would say that Mr. Bullock's letters to Mr. Williams, that appeared some time ago in the *Journal*, although containing some good ideas, certainly betrayed the fact, that in Wigan the manufacturers use at least double the quantity of coal per horse-power that is used in most other parts of Lancashire. Instead of 20 to 25 cwt. per horse-power per week, it is usually admitted—in this part of Lancashire at least—that 10 cwt. of good coal is amply sufficient, if calculated upon the actual work performed (and not on the nominal power used) by a good engine in a cotton factory. Now, what I want to know is this—Can a clear saving of 10 per cent. be made, or be shown to have resulted, from the adoption of any one improvement (excepting from expensive working), either patented or unpatented, that has been brought out for these twenty years past?

There is also another point of view in which I have recently been induced to consider the application of Mr. Williams's patent furnace, in consequence of having the inclosed copy of a "report" put into my hands by the author of the paper himself, owing to my asking his opinion of the furnace in question. This gentleman is the author of a work on steam engine boilers, and is considered by many to have a good practical knowledge of such matters. I am not competent to form an opinion as to the scientific or chemical portion of the question involved in the paper,

but, certainly, having sufficiently informed myself as to the facts on which the report is founded, by inquiry of the proprietor of the boiler, I must confess that my opinions are a good deal inclined to those of the writer; but I should certainly like to hear what Mr. Williams or others could say on the subject, for, however the parties may have erred in the practical application of his principle, in the case in question, there can be no doubt that there are difficulties suggested in the report, irrespective of the facts relating to this particular case, which many of your readers would be glad to see handled by Mr. Williams, and particularly that part relative to the possibility of danger from explosion.

In another letter I shall be glad to give you particulars of the successful introduction in this district of the patent felt clothing for boilers, Chapman's patent expansion gear, Scott's patent boiler cleaner, and Mr. John Wakefield's (whose name is in the report), improvements in firing machines, each of which, if we believe the respective patentees, save 20 or 30 per cent.!

Burnley, Dec. 15.

A MANUFACTURER.

REPORT PRESENTED TO MEMBERS, SAMMERT AND CO., CALCUTTA, BY THE

GENTLEMEN.—In accordance with your request, I have carefully examined into the circumstances attending the injury sustained by your steam-engine boiler, during the three days trial of Mr. Williams's patent smoke-consuming furnace, and have to report thereon as follows:—

Some of the plates in the boiler bottom behind the bridge appear to have been exposed to considerable degrees of expansion and contraction alternately, arising from frequent alterations of temperature, by which means the rivets have been dragged successively in opposite directions, until they have become loosened in the rivet holes, and the boiler has become leaky. One plate is what is usually called "burnt out," which is what generally happens when one side of an iron plate is frequently and suddenly heated and cooled, while the other side, from its contact with the water in the boiler, is kept at a moderately uniform temperature. In this case, also, owing to the necessarily laminated structure of wrought-iron, combined with the heating and cooling process above described, "a blister" has arisen in one of the plates, and this blister has been the immediate cause of the giving way of the boiler, by so far weakening it as to allow the pressure of the steam and water to force down the plate in that particular place. The main cause of the above results is clearly to be traced to the imperfect construction of the furnace, inasmuch as the passage for the admission of fresh air to the flame behind the bridge is unprovided with a valve or other means of regulating the quantity of air so admitted, or the time of its admission, within the reach of the engineer whilst engaged in firing the boiler. To enable me to explain this point more fully to your satisfaction, I may state that this mode of preventing, or (as it is most commonly called) burning the smoke, by admitting atmospheric air at or behind the bridge of the furnace, has been long known and frequently practised in Manchester, since it was first generally introduced here by Mr. John Wakefield more than twenty years ago. This gentleman also practised the method of diffusing the air through several small apertures inside the furnace chamber, in the same manner as Mr. Williams. But in all Mr. Wakefield's furnaces, as well as in those of Mr. Parker, that I ever saw, the passage through which the air was allowed to communicate with those apertures, was supplied with a regulating valve for the purpose of admitting the proper quantity of air, suitable to the varying state of the fire, or to shut it off at the discretion of the engineer or fireman. And the uniform practice of all competent engineers has always been, when no flame was passing from the fire, and consequently no smoke being made, to shut the air off entirely. In your case, however, the furnace is so arranged, that a constant large stream of cold air is uniformly rushing into the main furnace chamber or flame-bed of the boiler at all times, and whether there is a flame passing over the bridge or not. The certain and inevitable consequences of this state of things are, that every time the fresh cold air rushes in, it causes a flame to be produced sufficient to reach through the throat of the furnace, the current of fresh air passing in the manner of a blow-pipe, causing it to impinge with peculiar intensity against that portion of the boiler bottom immediately exposed in the direction of the blast. On the other hand, as soon as the fire on the grate has burnt bright, and the flame does not extend over the bridge, the cold air striking against the same part of the boiler bottom which had just before been so unduly expanded by intense heat, a sudden contraction of the metal necessarily ensues, besides a great waste of fuel and difficulty in keeping up the steam.

I have long paid great attention to the operation of smoke burning furnaces generally, and more particularly to those constructed on the principle so imperfectly attempted by Mr. Williams—that is, by supplying to the carbonaceous products evolved, their full saturating equivalents of oxygen for effecting the most perfectly attainable combustion of their elements, and thereby preventing smoke, but which can only be safely effected by carefully regulating the admission of air to the flame, for which, in Mr. Williams's plan, there is no provision made whatever. I have no hesitation in stating that the result of my experience is, a confirmed opinion against the economy of the process; being convinced, that, in ordinary circumstances, there is more fuel wasted by the admission of cold air to the boiler bottom, than is saved by the most perfect consumption of the smoke. This conclusion has been forced upon me by a careful and unprejudiced examination of a great many steam-engine furnaces erected both by myself and others, including several constructed by Mr. Williams himself.

I may take the liberty of concluding this report with a caution which I have been in the habit of giving verbally to all those who have occasionally consulted me on this subject for some years past. It is, that I have reason to believe that many of the lively fatal explosions of steam boilers, not otherwise satisfactorily accounted for, have arisen from similar causes to those detailed above—namely, frequent and sudden alternations of temperature at the lower part of the boiler, inducing a tendency to burst downwards, of which instances are constantly occurring. In fact, in the case of your own boiler, the minor explosion it has experienced, may be considered in the light of a very narrow escape, for if the blistered plate had been of rather a better quality of iron, so as to have held out a few days longer, or until one of two of the adjoining already injured plates had become nearly as weak as itself, in all probability they would have given way simultaneously, and produced an extensive explosion, the effect of which is usually, by reaction, to force the boiler upwards, sometimes to a considerable height through the supererecting buildings, in a way that has too frequently created an enormous destruction of life and property.

ROBERT ARMSTRONG.

(It is pleasing to find a subject which is of the first importance, and daily acquiring increasing interest, so ably and dispassionately discussed through the medium of our columns, and we trust the object which "A Manufacturer" has in view may be found to be combined with that to which he considers the greater importance is attached by the several patentees of smoke consuming apparatus, by the application of means whereby the nuisance arising from the emission of smoke may be abated, if not entirely remedied. We had been given to understand, that, with Chatter's patent, as well as with that of Mr. C. W. Williams, a saving of fuel was effected, by the consumption of smoke; but our correspondent would infer, that Mr. Williams's primary object was that of prevention of the nuisance arising from smoke, and that "the great question of economy of fuel" was, with him, "only a secondary consideration." We think "A Manufacturer" somewhat hasty in his conclusions, as, on the several occasions when we have had the pleasure of personally discussing this matter with that gentleman, Mr. Williams was evidently equally impressed with the importance of the one as of the other, while that of the economy of fuel becomes one of the first consideration. It is in the hope that a saving will be effected by the application of one or other means, that we are induced to devote so much space to correspondence on the subject. We shall continue to give insertion to the arguments or facts adduced by correspondents, and trust that, in the end, the object will be effected.)

## THE TRIANGLE AS A MECHANICAL POWER.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Most of your intelligent readers are aware that modern works of utility require the elevation as well as the lateral removal of large masses of matter. Leverage is, perhaps, the most simple, as well as the most natural, application of human strength; but as the arms of men (which are wonderful levers of the third kind, the power being applied between the fulcrum and the resistance) are of limited length and power—even levers of wood and metal in their simplest form must, to be still, be comparatively short, especially as the mass of matter employed as a lever must be of sufficient size to withstand the increased pressure or force from the fulcrum. To compensate for this limit of strength, human ingenuity contrives the more complex machinery of wheels, &c., and pays taxes to friction for an aggregation of power. There are, however, modes in which long simple levers may be used in mines, &c., with advantage, as was most practically demonstrated by the late Lord Goldsmith, on the removal and replacing of the Logan Rock, in this locality. All your readers may not have seen or understood the principle of that contrivance, where many triangles were used—I think three or four—but one will be sufficient to convey the idea. Keenly knows that the hypothetical line, converted into a perpendicular, or nearly so, will be farther from the base at the remote end, and would describe the arc A, and, in rising, would lift any weight suspended from or at the apex of its inclination. Several ropes, or chains,

may be attached to the apex of the triangle, and the fulcrum the men from the base the greater their power. By starting all the apices of any given number of triangles, with a horizontal line, the exact length of their distances, any number might be made to lift any given load together, provided the men drew nearly one way; or winches might be employed to draw one or more levers in nearly one direction, or in any direction, if the triangles be unattached. The less the base, in proportion to the height, the greater the power, on the mechanical law that we lose in motion what we gain in power, and vice versa. By continuously pressing the resistance, and shortening the chain C, any mass might be raised to any height less than the apices, where levers might also, if necessary be raised by banking. To prevent these lateral removals, or rather displacement, if



many erections of the hypothetical line be required, alternate sides of the triangle may be employed, or the whole elevation be effected by two erections, where one might otherwise accomplish the desideratum.

Penzance, Dec. 13.

ALFRED T. J. MARTIN.

## HISTORY OF THE RISE AND PROGRESS OF THE DURHAM COUNTY COAL COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Having seen in your *Journal* of the 18th instant, a statement headed "History of the Rise and Progress of the Durham County Coal Company," by "Philalethes," in which he asserts that he is fully acquainted with the circumstances in which the company originated, and having carefully investigated its career since, is fully competent to satisfy you as to the facts of the same, I beg, in reply, to state that I have not, nor have I ever had, a single share in the company; and, consequently, "Philalethes" is in error in describing me as a director, and, if not better informed on other matters, his information is not much to be depended upon. As one of the directors of the Clarence Railway Company, I defy him to produce any engagement, showing that the Clarence Company ever engaged to take 2000 shares in the Durham County Coal Company.

London, Dec. 24.

WILLIAM MORRICE.

[We presume that Mr. Morrice's name was alone introduced by our correspondent, in consequence of it having been inserted in the prospectus of the company, which, however, we know not to be an unusual course to be adopted by certain parties, who attach value to a name, whereby the public may be "suced" by relying on the high respectability of the party. This, however, is rather a matter for "Philalethes" to treat with than ourselves. As regards the engagement of the Clarence Company to take shares in the Durham County Coal Company, we have this to "Philalethes":—]

## DURHAM COUNTY COAL COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—My attention has been directed to a statement in the *Journal* of the 18th instant, signed "Philalethes," on the subject of the Durham County Coal Company, in which the names of Mr. Bowes and myself are introduced, and statements made entirely at variance with the real facts of the case. The author of this article states himself to be fully acquainted with the circumstances on which he writes, and that he can satisfy you as to the facts he professes to narrate; I have, therefore, in the outset, to require from you his name and address.

Barnard Castle, Dec. 22.

THOMAS WATSON.

[We decline to furnish the "name and address" of our correspondent, whose remarks on the Durham County Coal Company appeared in our last, as being altogether an unusual course. It is stated by Mr. Wheldon, that the representations of "Philalethes" are "entirely at variance with the real facts of the case." Now, under such circumstances, there can be no difficulty on the part of Mr. W. of refuting the statements which have already appeared in the *Journal*, the columns of which are equally open to the reply as to the charge of which complaint is made. "Philalethes" has expressed his confidence of satisfying us as to the "facts," and we doubt not he will be able to correct any errors into which Mr. Wheldon may incautiously fall, should he think fit to insert an answer in our pages.]

## DURHAM COUNTY COAL COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I can well imagine that the letter which appeared in your paper last week respecting the Durham County Coal Company was a puzzle to you, its contents surprised me; let me hope that you will continue to work this vein, as we have evidently got into a new strata. Your *Journal* was thought, at one time, to be an excellent whip for a certain party, and you will remember that I charged you with being too indiscriminate in the application of the lash. You have at length proved your independence, and those who were foremost in urging you on may now be disposed to cry "hold—enough!" but if they expect to stalk out of the fray by any such means, "I guess" they have mistaken their man, the *Mining Journal* will not be the organ of a party. I had formerly to remark upon your injustice towards Mr. Gibson. . . . The fact is, Sir, that Mr. G. was almost the only man at the board of directors in this devoted company, who was competent, by previous knowledge, business talents, and energy of character, to superintend and direct the complicated operations of so extensive a concern; and I am not singular in this opinion, I have conversed with other and wholly independent shareholders, who have expressed their sense of the company's obligations to Mr. Gibson. You are well aware how much depends upon directors, but in the Durham County Coal Company, if you except the solitary circumstance of their being partners in the concern, the present directors can hardly muster amongst them sufficient qualification to entitle them to be listened to on the colliery matters placed under their management. The managing director, however respectable as a London stockbroker, cannot be supposed to be much of an authority in coal mining; then we ring the changes upon farmers and architects, East India captains and shipowners, who form the remainder of the board, all of them, be it observed, residing at a distance from the scene of operations, meeting, perhaps, fortnightly or monthly, for a few hours, to pass resolutions formed upon hasty conclusions, or upon superficial reports of viewers, overseers, or fitters; and then the poor shareholders, pining for dividends, complain that private collieries in the contiguous districts, under private management, are at the same time paying well—the profits of the coal company being absorbed by railway dues, directors' salaries, and travelling expenses. It is to be observed that the present position of the coal company is much affected by the over production of collieries in this county during the last two years, and the new collieries forcing their coals into the various markets, cause a depression of prices (but this is an evil which it is to be hoped will be remedied, and then the company, under proper management, may see better days.

Dec. 22.

C. SMITHSON.

[We are glad to find that our correspondent admits the liberal principles on which the *Mining Journal* is conducted, as it would appear he once doubted our independence, but which he now considers "at length proved." We can assure him we have no party but such as truth and justice will uphold; we have no prejudice to bias our judgment, nor have we any private interests to serve. If we do occasionally go out of our way to give information, with the object of exposing juggling and abuses, it is done with the view of protecting the interests of the mining community and the capitalist, and hence articles will occasionally appear in our columns which cannot satisfy all parties. We find that Mr. Smithson complains of the want of business habits, as well as regular attention on the part of the directors, who are represented as absentees, and that while private collieries are paying well, "this devoted company" is "dragging its slow length along," and up with all sorts of items on the Dr. side of the account, save that of dividends. We do not pretend to offer an opinion as to the practical knowledge of the board as at present constituted, but we believe they have the credit of being honest—the late board was composed of gentlemen undoubtedly of more experience and practice, as demonstrated in the course which took place, and who might be equally as honest, but the proprietors thought the change an improvement. We hope they will not find themselves a second time deceived.

## DOINGS IN THE NORTH—CLARENCE RAILWAY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The letter of your correspondent, "Philalethes," appears to me to expose very and juggling on the part of the Clarence Railway directors with the Durham County Coal Company, although, as a shareholder in the railway, I should always be disposed to give credit to the legitimate assertions of the directors, in their endeavours to uphold as best a concern as the Clarence Railway has hitherto been; but, unfortunately, this railway was "a job" from the beginning, and undertaken, not with the intention of local improvement or investment of capital, but as a means to an end—the real object being to open a railway communication with extensive coal fields, purchased on speculation by Henry Blinfield, Esq., of London, and, by the completion of the line, he enabled Mr. B. to "feather his nest," by sales and leases to the Durham County Coal Company, and various other parties, to a great profit—amongst which parties is the Curdworth Coal Company, who took a railway in Mr. Blinfield's railway, under the guarantee of Mr. Thomas Fawcett, and a friend of mine, who is a partner in this concern, tells me he has heard his figure nearly by it, as the coal was not there. The country shareholders in the Clarence Railway have, for a long time, complained of the mismanagement by a committee in London, and which had given rise to numerous appointments of engineers and officers of the company, prejudicial to the interests of the proprietors, and a meeting was recently called, with the view of the railway being managed by a committee in the north, which, as the shipping place of the railway, seemed to be the proper place for the direction and administration of the affairs of the company. This plan did not, however, suit the views of Mr. Blinfield and his party, who, as we were told at the meeting with London parties, though it was London



shareholders had regarded their own interests properly, they would have probably come to a different conclusion. I trust still that the north country shareholders will continue their efforts to obtain the management of the railway by directors on the spot, to consist of gentlemen independent of all colliery interests; and, with the improving traffic, we may hope to see brighter days for this mismanaged and depressed concern.

A CLARENCE RAILWAY SHAREHOLDER.

Stockton-on-Tees, Dec. 23.

[We are not surprised at anything we hear of "doings in the north," whether as regards collieries, railways, or any other joint-stock undertakings, where "a job" can be "done," as some know better how to "do" it than our northern friends. It is to be regretted that Mr. Thomas Foster should figure so conspicuously in all these northern "doings," for here we find him as the protector (?) of the interest of the Cornforth Coal Company, who place under his superintendence and guidance the "winning" of a colliery where no coal existed. The complaint of our correspondent as to the management being in London, while the scene of operations is so far distant, is, by no means, singular; but if such was not the case, there would not be so good an opportunity for perpetrating "jobs." However, we doubt not the good sense of the London proprietors will, in time, lead them to disregard all other considerations but that of the interest of the body of proprietors at large, for it stands to reason that the affairs of a company cannot be well administered when the seat of government is hundreds of miles distant. In the case of the North Midland Railway, the direction and management of the undertaking was removed from London to the immediate scene of action, whereby a considerable saving has been effected in salaries and offices, while the supervision is immediate, and, we may presume, more efficient.]

#### WOOD PAVING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I beg to request the favour of your inserting the inclosed—an official contradiction of the leading assertion in Mr. Parkin's letter, published in your Journal of Saturday last. I must further trouble you with a comment or two on a single extract from that remarkable epistolary performance. Mr. Parkin says—"Which of Stevens's high-sounding appellatives—stereotomy of the cube, or 'pilula salutaris'—will most astonish the natives," it is not in my power to determine." This passage occurs at the close of a paragraph, in which Mr. Parkin leads your readers to believe that I have been "lecturing" (to use his evasive expression) on "Pilula Salutaris." The term "stereotomy of the cube" was originally used by the Count de Lisle, in describing the process of his invention; and I have ever so quoted it. This Mr. Parkin knows perfectly well, although, to suit his disreputable mode of attack, he thought fit to attribute it to me. Of the value, import, and perfect applicability of the term no man can doubt, unless he be some unfortunate sufferer from mental obliquity. The words "Pilula Salutaris" I am not conscious of having ever written before I copied them from Mr. Parkin's letter; and I do not remember to have ever uttered them. Nor did I ever write or lecture on medicine. Is it not, then, very reasonable to suppose, that one who, like Mr. Parkin, can thus gratuitously and groundlessly impute medical quackery to others, may be a quack in mechanics himself? With Mr. Parkin's disputes about patent rights I reiterate that I have nothing to do. In his proceedings at law I have no wish to participate; nor need I give myself the trouble to particularise some that when he has omitted to mention. But as, by persisting in his attempt to mix me up in these matters, it appears to me that he is desirous of eliciting my opinion with reference to the two patents, I have no hesitation in saying, that, as far as wood paving is concerned, I believe Mr. Hodgson's patent to be, both legally and practically, the most valuable extant; and that of Mr. Parkin among the most worthless. And now, Mr. Editor, let me close this unprofitable controversy—at least as far as I am concerned—by declaring that, whatever space may be continued to be given to his lunaticisms in your columns, I shall take no further notice of Mr. Parkin's ribald nonsense or random assertions. He compliments me by saying that I am "an adept in most things," but I cannot compete with him in falsehood and abuse.

J. LEE STAYNES.

Southwick Literary Institution, Borough-road, Dec. 20.

SIR,—I beg leave to reply to your letter of Saturday last, by stating that there is no foundation whatever for Mr. Parkin's statement in the *Mining Journal* of the 18th inst.—that the committee of the Southwick Literary Institution had partially confirmed you not to deliver a partial lecture "On Wood Pavements," nor has any disapprobation been expressed by the committee, as stated by Mr. Parkin.

To J. Lee Staynes, Esq.

THOS. H. TUCKER, Sec.

[We regret that our correspondents should indulge in personalities, and write in a spirit of animosity, which the question at issue renders unbecomingly. We shall, most certainly, so far as we are concerned, "close this unprofitable controversy," as any further communications can only be treated as advertisements.]

#### CAUSE OF THE PRESENT DEPRESSED STATE OF THE SOUTHERN RAILWAYS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Your obliging attention in inserting my two former letters, encourages me to proceed to state the result of my examination into the proceedings of the Greenwich Railway Company, as promised in my letter of the 26th November. Being, from circumstances, an occasional idle traveller along this line, the apparent deficiency of judgment and knowledge in the way in which the business is conducted, has led me to make many inquiries, as I have really a wish to see the company occupy that respectable station amongst railroads which it does not enjoy at present, but which its important situation, as an outlet from the metropolis for several different companies, entitles it to. I would caution the proprietors not to commit the same error they formerly were guilty of, and imagine that, by changing their directors, they make any advance towards improvement. I know not how often the proprietors elect their directors, but whenever the time comes, unless there should be some urgent reason for displacing an old director, or for wishing to introduce a new one, let them remain quietly—they should by all means avoid any speculative change. I find, some years ago, a committee appointed to investigate the affairs of the company; this committee (like most other committees) appears to have done nothing to benefit the company; and the chief result of their investigation was to discover the extraordinary energy and assistance which had been shown by a Mr. George Walter (one of their managing directors) from the origin of the company to the time this report was made; this has led me to inquire what is become of this Mr. Walter, and who has supplied the important void made by his ceasing to be connected with the company; and here I must say, I am rather perplexed with conflicting accounts and angry assertions, but whether the directors have been unfriendly to Mr. Walter, or Mr. Walter to the directors, is now of no moment whatever, and not worth knowing. It is no unusual thing in life to find a man who devotes his time and his powers to one darling object, to acquire a superior knowledge of that object as to enable him to succeed to a degree that no second man can be found to do, and yet, on other matters, he may be inferior in judgment to the generality of men. Now, from the report I have named, confirmed by the observations I have frequently received in the course of my inquiries, I should infer that Mr. Walter had this exhaustive knowledge as regards the Greenwich Railway—how he may be with regard to other matters I know not. My inquiries as to whether Mr. Walter was an engineer, or a contractor, or what he was, have frequently elicited the remark, that he was of gentlemanly manners, and had so clear and comprehensive a knowledge of railways in general, and of this in particular, that if the company had continued the benefit of his active exertions it would never have been in the state it now is, and that no man was so competent to recover it as he was. Meeting so frequently with an opinion of the powers of this gentleman in this particular way, and knowing how inestimable such persons are, that money cannot purchase them, nor experience always create them, I presume that there must be some good reason either on the part of the company, or on his own part, why they are not made available to the interests of the company; if such be the case, it would be well to procure as similar knowledge as can be attained elsewhere. The directors are not expected, or required, to have that knowledge of details as to enter into all the minute affairs of the company which require a constant personal inspection—they can best exercise that general oversight, which, if wisely considered, should work to the greatest advantage; but without proper oversight, their labour and attention must be unprofitable and useless. That some decided attention is required to improve the present imperfect system of this company must be evident to every person who has paid even a slight attention to all or any part of its management. I owe an apology to Mr. Walter for having so freely introduced his name, as I am sure he cannot have the most remote idea of whom he has to complain for this liberty, and I trust he will excuse my remarks; but he has been an often intruded on my notice, that I could not avoid referring to him, when seeking for a remedy for the depressed state of

this company; had any other occurred to me more likely to promote the interests of the company, I can assure him I should not have taken the liberty with his name that I have done. I am told a general meeting is shortly to be held—I hope that soberness, honesty, and judgment will dictate what will be for the benefit of the unfortunate proprietors.

Dec. 16.

AN OBSERVER OF RAILWAYS.

#### ON MINE SURVEYING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Divers Buzbodies, in their solution of the problem proposed by me in the *Journal* of the 27th of November, "ask" me a question—viz., "By what means I was enabled to state it so to vary?" To this I answer—by actual levelling and measurement. Should they be in any part near this, while I am here I shall feel very great pleasure in showing them the coal seam, with the surface so described, and also the method I adopted in measuring its dip. I may add, that the level I propose to find is not a straight line if driven in the coal. When a seam of coal is level, or has a uniform dip, and is free from "faults," mine surveying is merely plain sailing, and requires very little skill or knowledge to perform accurately—plane tracing and pegging on the surface, or on paper, and proof, by a table of natural sines, is all that is required; but when the coal has an undulating, or a twisted, surface (as no miner can deny it often has), the dip necessarily varies in its rate, and, when faults occur, the rate, as well as the direction, of the dip is often altered, and, in these cases, the skill and professional tact of the surveyor is required; and if we wish to treat the subject in a proper manner in the *Journal*, every possible case should be proposed and explained.

Featon, Potteries, Dec. 21.

G. KNOX.

#### ON MINE SURVEYING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Your valuable correspondent, "A Miner," has given the working, at length, of the first part of my survey for finding the back of a lode, and, so far as the computation is concerned, he has accomplished it with mathematical precision, but he has erred in the preliminary process of converting the drafts into bearings. The survey having been made (as expressly stated in the problem) with a "left-hand dial," whereas his conversion has been made as if the instrument had been graduated from left to right. His result determines the bearing of the twenty-four drafts to be  $88^{\circ} 28' W.$ , or the complement  $1^{\circ} 32' S. of W.$ , which exactly corresponds, as regards the quantity of the angle, with my published result of  $1^{\circ} 32' S. of E.$ , and the error of westing instead of easting is accounted for by the misunderstanding respecting the course of figuring of the dial; for, by an inspection of the "converting table," printed in the *Journal* in May last, it will be seen that from  $1^{\circ}$  to  $45^{\circ}$ , all bearings that stand  $S. of W.$  by a right-hand dial, are  $S. of E.$  when the graduation proceeds toward the left-hand. I hope I shall yet succeed in making this convenient little table universally understood, as it is of much service in metallic mining. There are few tin or copper lodes where we can, on an average, obtain a longer sight, through a level driven on their course, than ten fathoms, and sometimes not a third of this length—consequently, where the angles and observations are so numerous, it is a dubious, difficult, and retarding procedure, to attempt to obtain a register of the bearings underground, especially in places where the levels are low, or in passing over piles of ore or stulls, with the water streaming on the head of the surveyor, and with difficulty kept from the face of the dial. In such circumstances, it is quite enough for us to ascertain exactly the degree and fraction standing against the north point of the needle, without waiting to ponder out the bearing. One writer on this subject, who misleads himself "A Flat," appears solicitous for further information concerning this table. If ever the time should arrive, Mr. Editor, when you should be sufficiently free from "press of matter," as to have half a column to spare for *pro bono publico*, allow me to request you to favour us with a reprint of that table, with the explanations and examples. In reply to this gentleman, I beg to state that our circumferencers are graduated uniformly and uninterruptedly throughout the circle from  $1^{\circ}$  to  $360^{\circ}$ . The sights are fixed at  $360^{\circ}$  and  $180^{\circ}$ , and the eye of the observer should be placed at the right standing at  $180^{\circ}$ . On this arrangement the table has been contrived to suit both sort of instruments. Finally, we all know that the bearing of every observation must be correctly obtained, if the survey is to be worked out trigonometrically, and it is evident that no other method can possibly be relied on.

Cullington, Dec. 22.

JOHN BUDGE.

#### ON MINE SURVEYING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I observe that your able correspondents on mine surveying increase in number, as their communications do in interest. Now, Sir, as I think that science can be applied as well to the practical as to the theoretical department of mining operations in general—especially in coal mining—I beg to offer a hint to some of your able friends, that it (science) may yet do much in the way of more economically raising the various products of our mines to the surface. I mean the mode of constructing the shafts and their various adjuncts, underground carriages, description of engine and other power, as well as the best methods of pumping water out of our deep mines, and any other operations connected with their working. It is a subject which would be very interesting, as well as highly useful, not only to this district but to all others; and I think a discussion of such through your valuable columns may have a beneficial effect.

Newcastle-on-Tyne, Dec. 14.

A CONSTANT READER.

#### ON MINE SURVEYING—A PRACTICAL LETTER FROM AN EXPERIENCED MAN.

TO THE EDITOR OF THE MINING JOURNAL.

MR. HEDATUR—Sir, I've read several letters in your paper on dialling, some of them wrote by coal cappons some by kett drivers, and some by skadions but I have read one letter from one of the old duck jacket ball cappons of 40 or 50 years experience. Men I think too as know more about dialling a ball than one half of the men who have wrote you on that subject. I've been a cappon now Mr. Hedatur some 30 years, and been working in a ball since I was a little truncker 9 years old, so I hot to know something about a mine and dialling likewise. The great champion of your newspaper diallers is Mr. Jan Budge, who when I knowed on was a skout-master and a very good one he was to for teaching the children their a b c but he knows no more about a ball Mr. Hedatur then I know bout Lattin. He may be able to make a plan of a mine from the cappons dialling and to survey on the top but he would soon lose his way underground and take a vag or swallow for a level. How should a know anything about a ball Mr. Hedatur wen he never worked in one in his life cept as Honours account man at grass. Im gitting rather stiff now but Ill bet on fifty pounds that Ill dial a ball him or any of his triangle comrades, and be correct to a jiffy. I hate Mr. Hedatur to hear people making confusation of a plain thing just becase the will show their learning to the public and see their name in print. Now what have all this fuss ben made about dialling for. Have there ben any great mistakes made by cappons lately who choose to follow the old sure way. Have there ben any shafts of water cut lately and drowned the men, or any levels drove north to cut a shaft or lode when the shad a ben drove south. Not a bit of it, and the new lights pon dialling Mr. J Budge and Co have laid so many snares to the doors of the old cappons for following the old pegging system, I defy them to prove any great mistakes that was ever done by them. Why Mr. Hedatur its as easy for an old cappon to dial a ball as it is for him to follow his nose. Whats going to happen a man that gets eyes from going pon the same point at grass has he ded underground and of he do so how as he to make a mistake that he want to know. Its all humbug bout their farren names their hypocrisies and reusses and signs and counsigns which not one cappon in 10 understand nor care about cause they never want them. These things may do very well for men wen was never in a ball, but practice is the thing after all Mr. Hedatur and you know it to. Why Ill plain down the deepest shaft in the great Consols in half a day and out woss a minck. Im a plain old fellow Mr. Hedatur who never had much learning for I never cud get farder then multiplication in rethoritic and peeps arnt fit to give an opinion pon Mr. Budge and the other parties who have wrote pon dialling in your paper. But this is what I want to know Mr. Hedatur if dialling can be done correct by a plain unlearned man like me what are all the farren names and  $a \times b = c$  and other counsigns that these new lights make use of. Why if I dial a level 1000 fathoms, and the case is No. 10' west underground, and I want to sink a shaft at the end of the level from grass, if I go on the same point on the top as I ded below and take the same distance I say if I sink my shaft I shall come plump upon my level. If there be wossley at grass or underground I place it to a minck and no mistake. This is what I call

good practical work Mr. Hedatur plainer to understand and easier to do than is Mr. Budge and his party. If I want the dialling pon paper I take the two foot, with scale divisions on it, and measure it off to a T, and then let the clerk polish it up for the venturers. Dialling Mr. Hedatur is more of a hart than a science it requires care and attention joined to practice. Ive knowed men who possessed the three things named, and tho the cudden write a word the cud dial as well as eny men in the county. If Id ben to die I dont see the use of so much learning to make a man able to dial well. Hant he got the middle right before his nose as a guide, let him follow it on the same cuse at grass as he ded underground and Ill warrant hel be in no jopperday of making a mistake. These great steam hingin henovators, as my poor old friend Cappon Joe Oggers used to call all skemmers who had no practice pon the subject the wrote upon, are, just like the great wine directors who set in their palers in London and manage a mine in Cornwall. The later are capotol fellows for figures and reports, thell talk of this shaft and that level and tother lode and conclude by saying that the mine is very promising although the had lost meny thousands that quarter. Why Mr. Hedatur to read their promising reports one would think thed ben miners all their lives, and that all the balls in Cornwall would be rich enough next quarter. The truth is the hunt had no practice, the are paper miners who have learnt the litle the know (which is enough to lead their friends into mischief) whilst the have ben tucking in the punch at a count day dinner. So Mr. Budge and the other henovators pon the old way of dialling thell make a man believe who as had no practice that the are good miners, and that no body can dial a ball who eden a geomatar. I will stan to it that a man to dial well it eden any more necessary for him to learn geometry than it is for him to learn it to to use pick and gad. It requires practice to learn both well and that es all thats required. Now Mr. Hedatur I must conclude, and as I take up your paper I hope youl put this in your next, and that it will have the affect of rousing sum of my old brother cappons in Cornwall to write you and stick up for themselves. But this I will say if I fight alone Mr. B and his party shant have it all their own way, when I see a thing in use thats answered all purposes required for hundreds of ears with litle trouble and spense, I shant stand silent and see it changed till I am vinced the new one is better than the old. Hoping your paper well turn out a good bargin to you, I remain your obedient servant,

OFFEY TRUGGIN,

Paradise-street, Liverpool, Dec. 13. Late Cappon in East Rieddick.

P.S.—I must trust to you to put stops where the are wanted as I dont know much about that work.—All the parties who have answered questions pon dialling in your paper, have gave different answers to the questions no two being the same, how then can their plan be a correct one. O. T.

"I say, Jan, dost the cale this nuthin?" we think we hear a "comrade" exclaim, on reading the letter of Capt. Truggin, who certainly is no advocate for new lights, therefore we presume the "Bude" light and the "Budge" light are alike in his estimation. There can be no doubt but that the "Bal cappons" of the present day are men of very superior abilities to those of thirty years' since, and we doubt not but that there are many who, like Capt. Offey Truggin, even with less than "thirty years experience," are perfectly competent to dial without the aid of "hypocrisies and reusses and signs and counsigns;" but the importance to be attached to the discussion of the subject, and the arguments adduced on the part of the "new lights," appear to us to be whether, as a practical system of mining education, the miner should continue to adopt the pegging system, or avail himself of practical culture, combined with practical observation. We are much disposed to lean to the instruction of youth in the sciences connected with mining, whereby they may be able to distinguish one stratum, or rock, from another, and not confound them, as was done in former times, by confining the description to local terms, which, as in the case of "killas," might be said to mean any other substance than granite or ore. In like manner, we think that advantages are to be derived from application to "geometry," which may aid the miner, and enable him to test the correctness of any dialling by the "pegging system."

#### SPELTER MANUFACTURE.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Feeling, as I do, that few, if any, papers have been more beneficial to the causes they advocate than the *Mining Journal*, and that you take great interest in all matters connected with mining operations, I now beg to solicit your attention to the high price of spelter, and the comparative low price of black-jack; when spelter was under 20*l.* a ton, the mines, with which I am connected, received within a few shillings as much as it does now spelter is 40*l.*, still the manufacturer says he cannot advance the price of jack. It appears to me, Mr. Editor, that the spelter makers, like the lead ore merchants, have it all their own way, and, as there are but few of them, have a sort of combination to keep down the poor miner. I well remember your observations upon the secrecy observed by the lead merchants in the ticketing of ores for sale in the Flintshire market, and your regret that those ticketings are not published in the same manner as the Swanses copper sales. Now, with respect to black-jack, I am convinced you can be of infinite service to the miner if you would take the trouble to ascertain and publish the probable cost of the manufacture of a ton of spelter, say black-jack at — per ton, coal —, and other charges, if any, at —, and thus enable the miners to have a better idea of what they really ought to receive for their black jack, and who I should hope would then hold together a little, and break up what at present I believe to exist—a "spelter manufactory monopoly."

Dec. 23.

A BLACK-JACK MINER.

[Our correspondent does not seem aware that the quantity of spelter manufactured in this country is very limited, and that black jack is not exported, the ore used in Belgium and Silesia being calcamine. Black-jack raised in this country being treated as a refuse ore (from the demand not being equal to the supply), there is no prospect of an advance taking place of any moment—certainly not in proportion to the rise in the market price of spelter, which is mainly governed by the make in foreign countries, and the consumption. We shall be most willing to aid the "black-jack" miner, but do not think the time has yet arrived when he may calculate on any material rise.]

#### MINING CORRESPONDENCE.

##### ENGLISH MINES.

WOLMURSH MINING COMPANY.

Dec. 20.—I beg leave to inform you that the lode in the 110 fathom level west is ten inches wide, and producing stones of ore. In the cross-cut at this level, to the north lode, the ground is still hard. The lode in the 100 fathom level west continues about one foot wide, and worth 1*l.* per fathom. In this level, east of the engine shaft, we are driving on a branch about five inches wide, the main part of the lode at this point being split into branches. The lode in the eastern stopes, in the back of this level, is twenty inches wide, and worth 2*l.* per fathom. The lode in the western stopes, in back of ditto, is twenty inches wide, and worth about 3*l.* per fathom. In the ninety fathom level west the lode is sixteen inches wide, and worth 2*l.* per fathom. The lode in the eastern stopes, in the back of this level, is fifteen inches wide, and worth 2*l.* per fathom. The lode in the western stopes, in back of ditto, is two feet wide, and worth about 3*l.* per fathom. In the eighty fathom level, east of Wall's shaft, the lode is eighteen inches wide, and producing stones of ore. The lode in the stopes, in the back of this level, is eighteen inches wide, and worth 3*l.* per fathom. The Flagjack lode, in the seventy fathom level east, is three and a half feet wide, with a small proportion of ore. In this level west the lode is two feet wide, and producing good stones of ore. In the sixty-two fathom level, east of Wall's shaft, the lode is ten inches wide, and at present unproductive. The tribute pitches are still looking favourable.

F. PHILLIPS.

TRAILING CONSOLS MINING COMPANY.

Dec. 18.—We have nearly drained the bottom level at Christine, but have not been able to see the ends. The sixty continues worth 1*l.* per fathom. The fifty west is also good, the lode worth 40*l.* per fathom. The fifty east is also good, rather better than it has been. In the old dump-shaft we have commenced driving to cut the lode under the side, which we expect is not far distant. At Good Fortune shaft, the forty-four east is rather hard, and at present poor. This level west is two feet wide, producing four tons of ore per fathom. Gordon's shaft continues to go down in favourable ground.

W. SINCOCK.

GREAT WHEAL CHARLOTTE MINING COMPANY.

Dec. 22.—The lode in the eighty-two fathom level west from shaft is seven feet wide, producing some good stones of ore. The same level east is poor. The lode in the seventy-two fathom level is six feet wide, turning out about 1*l.* worth of ore per fathom. The lode in the stopes, back of this level west, is three feet wide, worth 1*l.* per fathom. The lode in the stopes, back of this level east from shaft, is two feet wide, worth about 7*l.* per fathom. The lode in the stopes, bottom of this level east from shaft, is four feet wide, yielding five tons per fathom, worth 1*l.* per ton. The stopes in the bottom of this level west is worth about 1*l.* per fathom. The lode in the stopes, bottom of the sixty-two fathom level west from shaft, is three







